Beyond Energy, Capacity & Line Losses: A New Look at the Benefits of CHP in California

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On behalf of the California Cogeneration Council, Cogeneration Association of California, and the Energy Producers and Users Coalition

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A Combined Heat and Power Association

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CHP benefits beyond energy, capacity & losses

- Avoided Transmission Costs
- Reduced GHG Emissions
- Price Mitigation Benefits
- Enhanced Reliability – Resiliency
- Resource Diversity and Efficiency: CHP in the context of the 2050 carbon reduction goal
- Supports California's manufacturing, industrial and commercial base (refer to CMTA presentation)
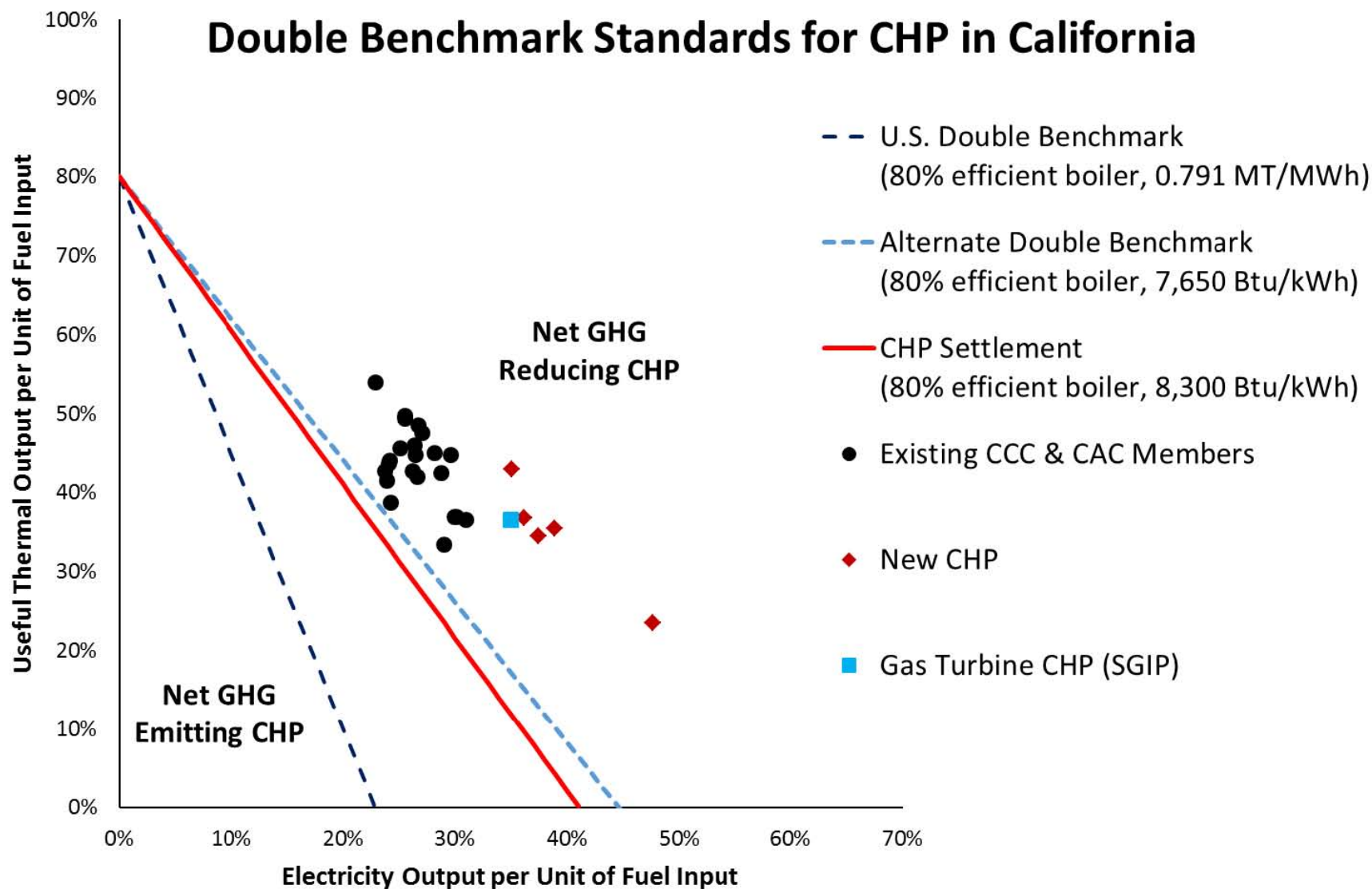
Load Center CHP:
Metrics for Avoided Transmission Capacity Costs

- Marginal load-related transmission costs
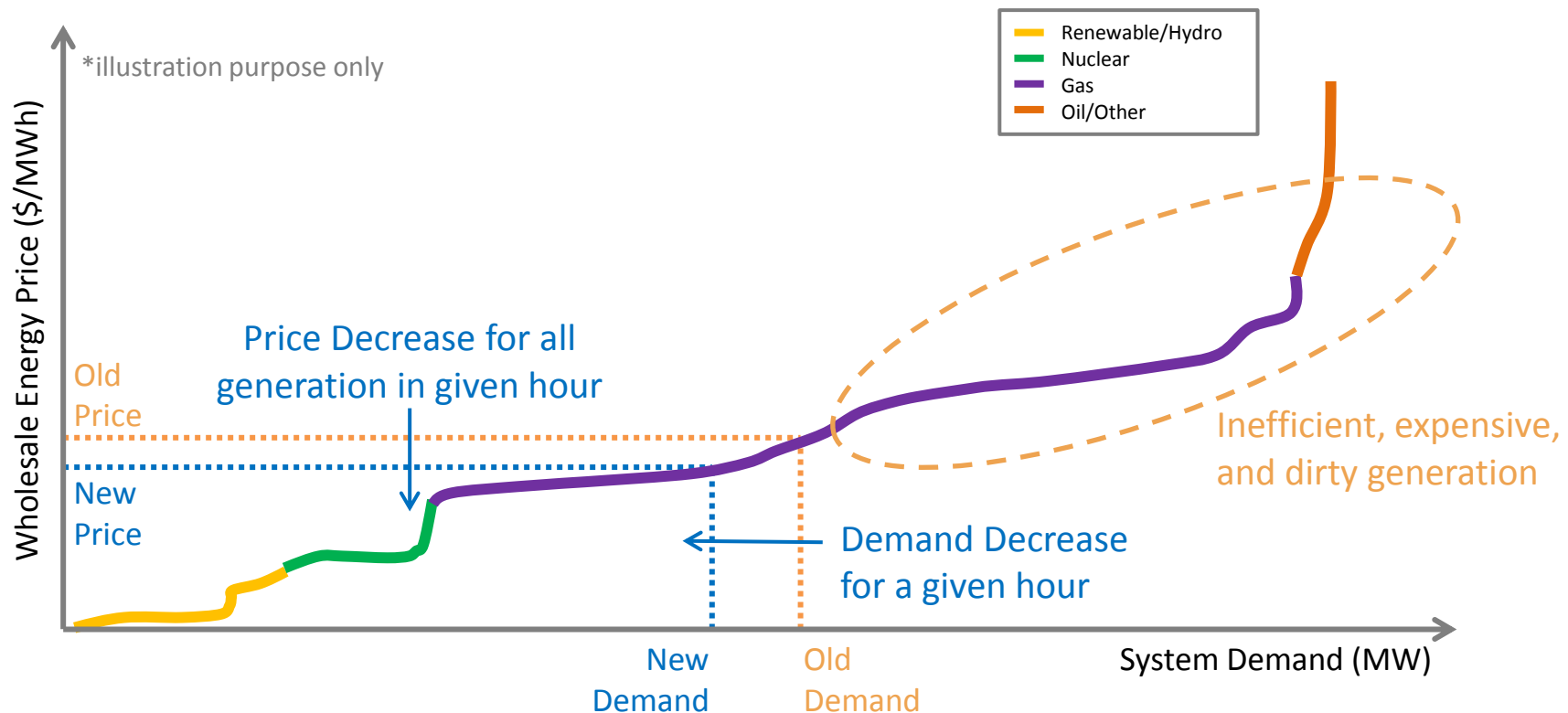 - *Source: IOU DR Filings / IOU GRCs / San Diego Solar DG Study*

Utility	CAISO High Voltage ($/kW-yr)	IOU Subtransmission ($/kW-yr)
PG&E	19	20
SCE	59	24
SDG&E	103	22

- 10% adder for AB 1613 CHP in LCR areas
- ICF: $50/kW-yr T&D capacity deferral from CHP less than 20 MW
- Transmission costs for new renewables
  - E3 Report on 50% RPS in California
    - 4.6 c/kWh for out-of-state renewables
    - 3.4 c/kWh for in-state renewables

GHG Emission Reductions:
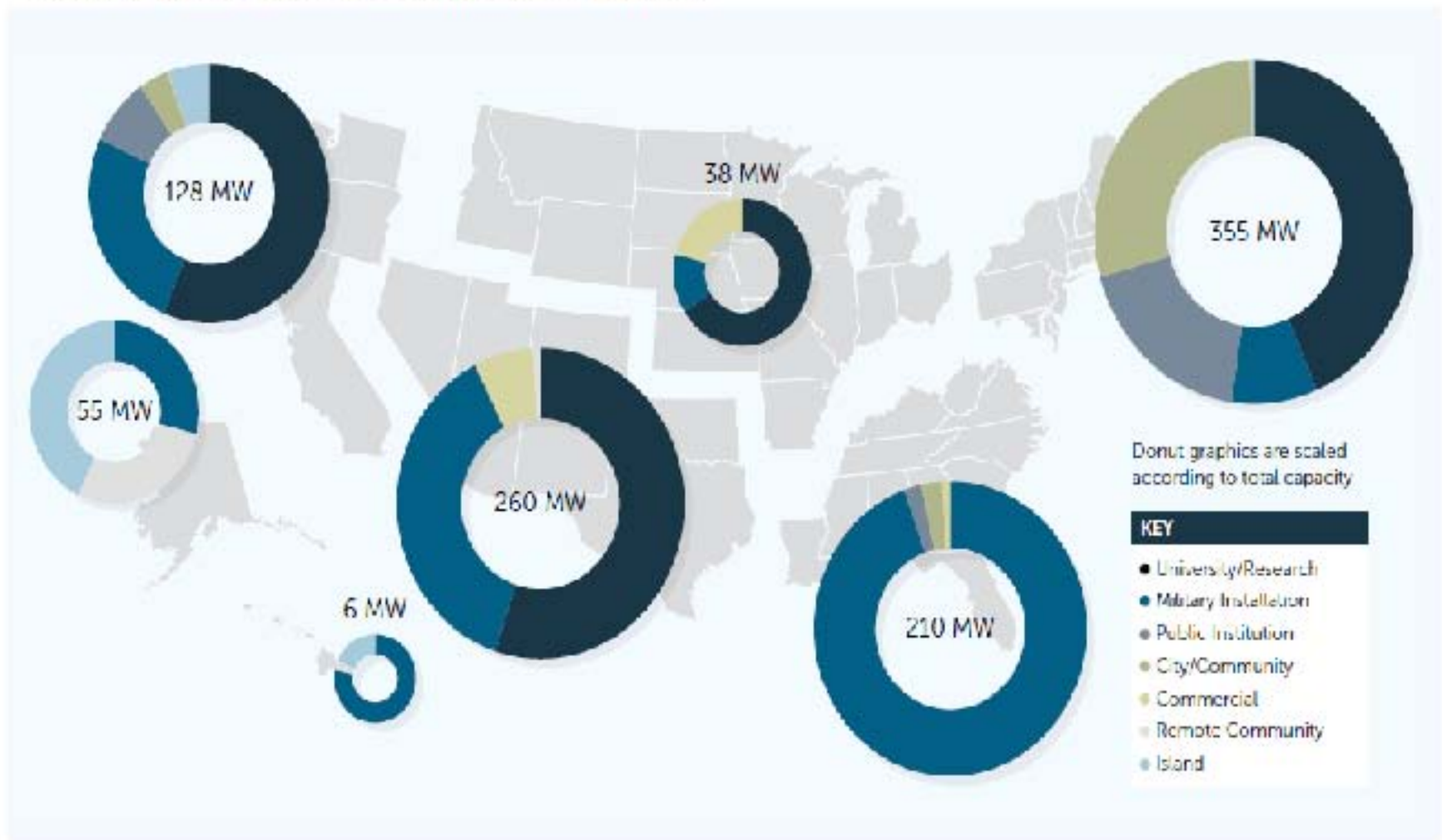Double Benchmark Standards for CHP in California

*illustration purpose only

Legend:
- Renewable/Hydro
- Nuclear
- Gas
- Oil/Other

Wholesale Energy Price ($/MWh)

Old Price

Price Decrease for all generation in given hour

New Price

Demand Decrease for a given hour

Inefficient, expensive, and dirty generation

New Demand

Old Demand

System Demand (MW)

Lowering system demand in a given hour results in having lower price setter, and therefore lower energy price

Microgrid Capacity by End-User Type and Region (MW)

Source: Klemun, Magadelana, "North American Microgrids 2014: The Evolution of Localized Energy Optimization" (Greentech Research, 2014).

2050: Resource Diversity and Efficiency

- 2050 goal: 80% reduction from 1990 emissions.
  - Electrification of multiple sectors: transportation, buildings & low-value heat.
  - Fuel use must be highly efficient.
- CHP allows any fuel to be burned efficiently, with cogeneration of electricity.
- Resilient generation w/access to load centers will be favored.
- Resource diversity is essential.
  - Need baseload & flexible resources as wind & solar penetration grows.
  - Customers will seek choices in electric service.